

## 5.6b Inverse functions and “U” substitution with logarithms

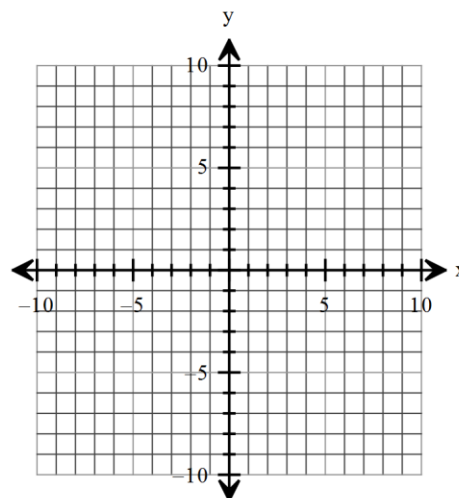
Name \_\_\_\_\_ Date \_\_\_\_\_ Period \_\_\_\_\_

Graph each function and its given inverse on the same Cartesian plane. Make a table of values for each function to get the graphs. Do not use a graphing calculator!

1.  $f(x) = 3^x$ ;  $f^{-1}(x) = \log_3 x$

$x$	$f(x)$

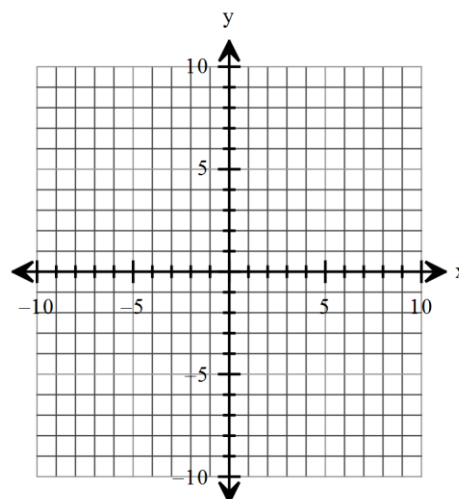
$x$	$f^{-1}(x)$



2.  $f(x) = \frac{1}{2}^x$ ;  $f^{-1}(x) = \log_{1/2} x$

$x$	$f(x)$

$x$	$f^{-1}(x)$



Find the inverse of each function. Leave all answers with positive or rational exponents if possible.

3.  $f(x) = \log(x - 4) + 2$

4.  $f(x) = \log_5(x - 7) - 4$

5.  $f(x) = \log_{10} x + 2$

6.  $f(x) = e^x - 3$

7.  $f(x) = 2^{(x+2)} + 1$

8.  $f(x) = 5^{(x-4)} + 1$

9.  $f(x) = \log(2x) - 1$

10.  $f(x) = \log_4(2 - x) - 3$

11.  $f(x) = \ln(x + 1)$

12.  $f(x) = \frac{1}{3}e^{(2-x)} + 4$

13.  $f(x) = -\ln(-x)$

14.  $f(x) = -2\ln(x - 3)$

15.  $f(x) = -2 \cdot 3^{(1-2x)} + 5$

16.  $f(x) = 5^x + 2$

**Solve each equation using substitution. Show all work. Round to the nearest ten thousandths.**

17.  $e^{2x} - e^x - 6 = 0$

18.  $e^{4x} - 3e^{2x} - 10 = 0$

19.  $e^{2x} - 7e^x + 6 = 0$

20.  $3^{2x} + 3^x - 20 = 0$

21.  $5^{2x} + 3 \cdot 5^x - 10 = 0$

22.  $4^{2x} - 4^x - 30 = 0$

23.  $6^{2x} - 6 \cdot 6^x + 9 = 0$

24.  $2 \cdot 7^{2x} + 11 \cdot 7^x + 5 = 0$

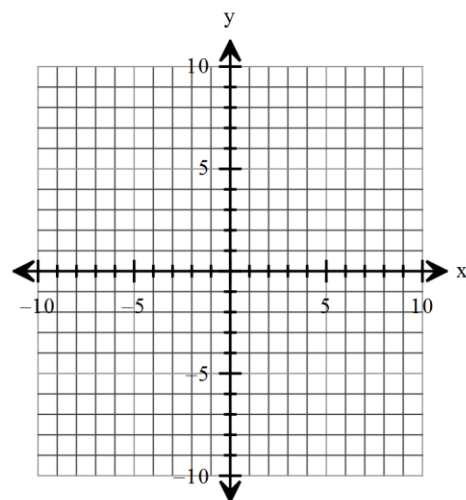
Use the given function  $f$  to:

(a) Find the domain of  $f$ . (b) Graph  $f$ . (c) From the graph determine the range and any asymptotes of  $f$ .

(d) Find  $f^{-1}$ , the inverse of  $f$ . (e) Find the domain and range of  $f^{-1}$ . (f) Graph  $f^{-1}$

Use transformations and a table of values to get the graphs. Graph on same plane. No graphing calculators!

25.  $f(x) = \ln(x+4)$



26.  $f(x) = \log(x-4) + 2$

